

**METHOD AND APPARATUS FOR CONTINUOUS
VALUED VOCAL TRACT RESONANCE TRACKING
USING PIECEWISE LINEAR APPROXIMATIONS**

ABSTRACT OF THE DISCLOSURE

5 A method and apparatus tracks vocal tract
resonance components, including both frequencies and
bandwidths, in a speech signal. The components are
tracked by defining a state equation that is linear
with respect to a past vocal tract resonance vector
10 and that predicts a current vocal tract resonance
vector. An observation equation is also defined that
is linear with respect to a current vocal tract
resonance vector and that predicts at least one
component of an observation vector. The state
15 equation, the observation equation, and a sequence of
observation vectors are used to identify a sequence
of vocal tract resonance vectors using Kalman filter
algorithm. Under one embodiment, the observation
equation is defined based on a piecewise linear
20 approximation to a non-linear function. The
parameters of the linear approximation are selected
based on pre-defined regions, which are determined
from a crude estimate of a vocal tract resonance
vector.

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